THE INSTITUTE OF PHYSICS
47 BELGRAVE SQUARE, LONDON, S.W.1.

BULLETIN

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CONTENTS

	Page
NOTICES TO MEMBERS	269
NATIONAL CERTIFICATES IN APPLIED PHYSICS 1955 EXAMINATIONS	274
ADDITIONAL INSTITUTE MEETINGS	275
PHYSICAL SOCIETY MEETINGS	275
CORRESPONDENCE	276
REVIEWS OF BOOKS	277
NEWS OF MEMBERS	281
THE REGISTER	283
APPOINTMENTS VACANT	ii

The Bulletin is not intended for general circulation : your copy should not therefore be passed to a library.

APPOINTMENTS VACANT

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

Central Electricity Authority, Research Laboratories, Leatherhead, requires **General Assistant Engineers.** Candidates should have Higher National Certificate or equivalent qualification in electrical or mechanical engineering or physics. Duties include the maintenance of a wide range of specialized instruments. Salary N.J.B. Grade 5, £475–£650 p.a. according to qualifications and experience. Applications stating age, qualifications, experience, present position and salary to D. Moffat, Director of Establishments, Winsley Street, W.1, by November 18. Quote Ref. AE/673.

The Atomic Weapons Research Establishment, Aldermaston, Berkshire, require **Senior Experimental Officers, Experimental Officers** and **Assistant Experimental Officers** in the rapidly expanding Nuclear Physics Branch. Duties include :

(i) work in a Thermonuclear Physics Group studying methods of utilizing energy from the fusion of light elements ;

(ii) co-operation with physicists carrying out experiments with nuclear particle accelerators including a 6 Mev. Van de Graaff generator. Previous experience of particle detection techniques, gas discharge and high vacuum work, electronics or high voltage engineering would be an advantage, but it is not essential. Minimum qualification is Higher School Certificate (Science) but a pass degree in Physics or Electrical Engineering would be an advantage for the senior posts.

Salary in the range of £330–£1,350 depending on age, qualifications and experience. Contributory Superannuation Scheme. Successful married officers now living outside the Establishment's transport area will be eligible for housing on one of the Authority's estates ; until housed a lodging allowance may be payable.

Requests for application forms by post card to Senior Recruitment Officer at the above address. Quote reference 760/110.

The University of Sheffield

Applications are invited for a post of **Lecturer in Fuel Technology** and **Chemical Engineering,** to begin duties on January 1, 1956. There are good facilities for research. Salary scale £650 × 50—£1350 with F.S.S.U. provision and family allowance. Initial salary according to qualifications and experience. Further particulars should be obtained from the Registrar to whom applications (five copies) should be sent by November 19, 1955.

Due to expansion plans in Croydon area which involve development of novel instruments and controls, it is found necessary to recruit an experienced **Physicist/Engineer** with an interest in the application of instruments to the control of industrial processes. Commencing salary will be £1,500 p.a. It is probable that a good honours degree will be necessary to fill this appointment adequately and experience of mechanical, pneumatic, optical or servo development work is essential. In addition, two Junior Physicists of graduate status with or without experience are required. Superannuation scheme available. Commencing salary £800 p.a. Applications to C.D.E. Box No. 87, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

British Petroleum Company Limited invites applications from young Graduates with a degree in Engineering, Physics, Mathematics or Natural Philosophy, to be trained as Petroleum Engineers. Training will last for approximately 2 years and will take place partly in the United Kingdom and partly overseas. On successful completion of the training, men will be posted as **Resident Petroleum Engineers** to exploration areas overseas. Age preferably not over 26, National Service obligations must have been fulfilled. Write stating age and full details of qualifications and experience quoting H.2089 to Box 7649, c/o 191 Gresham House, E.C.2.

Graduates

of proven ability in their present fields, and who would be interested to consider a career in electronics, are invited to discuss the careers that would be open to them with Decca Radar Limited. The Company is expanding rapidly both in size and scope of interests, and the opportunity is extended to first class men to train at a salary dictated to some extent by their standing in their present field for command positions in the research laboratories of the Company. A pension scheme is in operation. British Nationality is essential. Please write, giving full personal details, to Decca Radar Ltd., 2 Tolworth Rise, Surbiton, Surrey, quoting reference RLA.104.

British Petroleum Co. Ltd. has vacancies for **geophysicists** on its exploration staff. Candidates should have an honours degree in physics with subsidiary mathematics and/or geology, but candidates with a general degree will be considered. The work involves delineation of underground rock structure by seismic, gravitational and magnetic techniques and offers considerable scope for men with initiative who are prepared to travel and to work abroad. Normal leave is four months after two years' foreign service.

When conditions permit, facilities are afforded for married men to have their families with them on foreign tours.

Basic salary is commensurate with age and experience, commencing at £870 for young, inexperienced graduates. Appropriate allowances are paid whilst on foreign service. Generous pension scheme.

Applications quoting F.107, should be addressed to Box 1442, c/o 191 Gresham House, E.C.2.

United Steel Companies invite applications from young science graduates keen to do laboratory and plant research on steelmaking furnaces. Reply, Assistant Director of Research, Swinden Laboratories, Moorgate, Rotherham.

Queen's University, Belfast

Physics Department

Applications are invited for a **Research Assistantship** for work either on oscillatory properties of discharge tubes, or production of spectra of astrophysical interest. Salary up to £500 per annum. Applications should be sent to Professor K. G. Emeleus, from whom further information may be obtained.

(*Continued on page v*)

THE INSTITUTE OF PHYSICS

Vol. VI, No. 11 **BULLETIN** November, 1955

NOTICES TO MEMBERS

Proceedings of Extraordinary General Meeting

An Extraordinary General Meeting of the Institute was held on October 4, 1955, at the Institute's House. Prof. F. A. Vick (*Vice-President*) was in the Chair. A quorum being present the Secretary read the notice convening the meeting. The following resolution was proposed by Major E. H. W. Banner (*Fellow*) and seconded by Prof. W. E. Curtis (*Fellow*) :—

> That By-Law 44 (i) be deleted, and the words " Save as provided in By-Law 44 (i) " be deleted from By-Law 44 (ii).

After a brief discussion of the resolution, a poll was demanded by the Chairman in accordance with Article 77. Major E. H. W. Banner (*Fellow*) and Lt./Col. H. S. Young (*Fellow*) were appointed scrutineers for the ballot. 473 members had appointed Dr. H. R. Lang (*Fellow*) to act as their proxy. The resulting vote on the resolution was 453 for and 31 against. The resolution was declared carried.

The purpose of the deletion of this By-Law is to enable the Board to meet rising costs by requiring Fellows and Associates who take the Journals to pay extra for them and by ceasing to send them to those who do not require copies for their personal use. Details are given below.

The Board recognizes that these new arrangements may impose a slight hardship on life members and members of long standing who do not yet come under the " 65-year " rule (see below). The Treasurer has therefore been authorized to deal sympathetically with such cases so that they may continue to receive one of the Institute's Journals without additional payment as well as the *Bulletin* if they specially desire.

> *65-year rule.*—" Members over 65 years of age who have been members for at least twenty years may, if they so wish, have their future annual subscriptions remitted, but they will then only be entitled to the Institute's publications upon the same special terms as are current for Students (see p. 272)."

The improved monthly *Bulletin* will be sent automatically and without charge to all grades ; and there will be no change in the charges for periodicals to Graduates, Students or Subscribers.

Distribution of Periodicals to Members in 1956

The following is the memorandum that was circulated to Fellows and Associates in explanation of the Board's proposals that were approved at the Extraordinary General Meeting held on October 4, 1955.

"To safeguard the Institute during the next few years, it is necessary to increase its income by at least £4,000 p.a. above the present level, apart from increased subscription income arising from new Members. It is not possible to look ahead for a longer period because changing conditions make any general forecast uncertain. The increase is, in the main, to come from an increase in the retail price of the well established *Journal of Scientific Instruments* to libraries and non-members next year. The increase from £4 to £5 p.a. for the volume is expected to yield an additional income of about £3,000 p.a. There will be no variation in 1956 in the price of the recently established and smaller *British Journal of Applied Physics* from the current rate of £4 p.a.

"The annual consultative meeting of Honorary Officers of the U.K. Branches and Groups held on July 13 last, in its report to the Board, recognized that Members must eventually bear some share of the increase in costs the Institute has to face, but hoped that it would be found possible to postpone any increase of charges to Members at least until January, 1957. In considering the report, your Board gave earnest consideration to this, but in the certain knowledge of a very substantial rise in the cost of printing and paper to be expected later this year, and of an increase in the rent of the House from midsummer, 1955, an increase in the rates on the House, and in the salaries and wages which will be required to retain and recruit staff in the face of competition, it was unable to accept further delay without impairing the future of the Institute. Your Board also gave careful consideration to variations on the specific proposals made by individual Branch or Group Officers at the meeting, but decided that none of them offer any particular advantage over those that had been selected by its Finance Committee after examination of several alternatives.

"Your Board therefore submits the following proposals for the approval of the Members (i.e. Honorary Fellows, Fellows and Associates), which approval may be indicated by voting personally or by proxy for the formal resolution set out on the opposite page. If approved, it is intended that the proposals become effective from January 1, 1956.

Fellows and Associates who now receive either Journal without extra charge and the other one for an additional £1 1s. p.a. shall be required to pay a quarter of the retail price for one Journal (£1 5s. for J.S.I. or £1 for B.J.A.P.), and if they wish to have both Journals the payment shall be £2 p.a. for the two Journals. The monthly *Bulletin* will be further improved in content and standard of production, and include indicative abstracts identical with or based on those at the head of each paper and special article in both Journals.

" This charge is expected to yield a minimum of £1,000 p.a. and there will be a corresponding saving of £500-£1,000 by virtue of the Journals not taken by Members.

(It is not proposed at present to vary the rates, which were only recently fixed, at which Graduates and Students may receive Journals, namely £1 1s. p.a. for each, or the rates to Subscribers, namely £1 11s. 6d. for the first Journal and £2 2s. for the second. It should be remarked that the annual membership fees of overseas Fellows are £2 2s. less and of Associates £1 1s. less than those in the U.K.)

" Your Board has decided that the size of the annual volume of both Journals should not, in the immediate future, exceed that budgeted for in 1955 (J.S.I. 522 pages and B.J.A.P. 456 pages, excluding Supplements).

" In future a small charge may be made to Members and others for Supplements to the Journals, to ensure that the Institute does not sustain a loss on them.

" The separation of the charge to Members for the Journals from the annual subscription and the deletion of By-Law 44 (i) has the advantage that it will no longer be necessary to change subscription rates solely because of a continued rise in the cost of production of the Journals, which is largely beyond the control of the Board.

" It is not intended to request Members who have them, to change their standing Banker's orders, but to invite them to pay the appropriate additional amount (if any) by cheque."

The Board wishes to ensure, so far as is possible, that members taking any periodicals through the Institute, shall receive their January, 1956, issues promptly on publication. In order to achieve this all grades are invited to order them now (but they will not be asked to pay for them until January next). The enclosed form (page iv) should be sent to the Secretary **immediately** and no guarantee of prompt delivery of

Journals or publications can be given to those whose forms are received after November 20 next, although every endeavour will be made to give good service. (Members resident in Australia or New Zealand should ignore this notice as they will receive a separate one from the Branch Secretary, who will transmit their requirements to London.)

The 1956 rates for the Institute's Journals will be :—

	J.S.I.	*B.J.A.P.*	*Both*
†Fellows and Associates...	£1 5s.	£1	£2
*Graduates	£1 1s.	£1 1s.	£2 2s.
*Students	£1 1s.	£1 1s.	£2 2s.

*Subscribers : one Journal for £1 11s. 6d. and the second one for a further £2 2s. 0d.

† *Previously no charge for the first Journal and £1 1s. 0d. for the second.*

* *No change in rates.*

There will be no change in the rates for the other periodicals referred to on page iv.

United Nations Conference in Geneva

At its meeting on October 4 last, the Board of the Institute unanimously resolved as follows :—

> "That it be recorded in the minutes of this Board that it has noted that the British physicists, under the leadership of the President, played a prominent part in the recent United Nations Conference on "The peaceful uses of atomic energy," and is happy to see this further contribution to one of our Institute's principal objects, namely, the advancement and diffusion of a knowledge of physics, pure and applied."

New Publications

The Institute will be publishing three new volumes on December 1, one in the *Physics in Industry* series and two in the series of *Monographs for Students*. The former is *Physics of Fibres* by H. J. Woods (*Fellow*), the retail price of which is 30s. ; members may obtain one copy of this book for their personal use at the reduced price of 25s. A prospectus and order form will be included in the November issue of all the Institute Journals and members taking Journals are asked to use the form ; others should send in their orders with remittances to the Institute.

The two new volumes in the Student Monograph series are *Errors of Observations and Their Treatment* by Dr. J. Topping (*Fellow*) and *Humidity* by Dr. H. L. Penman (*Fellow*). A leaflet about these volumes and an order form are enclosed with this *Bulletin*. The retail price of each volume is 5s., but a copy of each may be obtained by members for their personal use at the reduced rate of 3s. 6d.

"Soviet Physics"

The American Institute of Physics announce the publication of a new bi-monthly entitled *Soviet Physics*. This publication will make available in English, reports of current Soviet research in physics as contained in the *Journal of Experimental and Theoretical Physics of the Academy of Sciences of the U.S.S.R.* All issues of the Soviet journal after January 1, 1955, will be translated.

One volume is published annually. Volume 1 (1955) will contain three issues. Subsequent volumes, beginning with January, 1956, will contain six issues.

Subscription : Vol. 1, 1955 (3-issue volume) $16.00
(United States and Canada $15.00)
1956 onwards, per annum $32.00
(United States and Canada $30.00)

Subscriptions should be addressed to the American Institute of Physics, 37 East 55 Street, New York 22, New York.

The Protection of Workers against Ionizing Radiations

We have received a copy of a very readable and informative 66-page survey report presented by the International Labour Office to the Geneva Conference on the Peaceful Use of Atomic Energy entitled *The Protection of Workers against Ionizing Radiations*. Prepared for the International Labour Office by Mr. K. L. Goodall, H.M. Chemical Inspector of Factories (a Fellow of the Institute), it covers the following subjects :—

Part I—the interests of the International Labour Office in radiological protection ; Part II—the history of radiation injuries, the nature and properties of the various ionizing radiations and the injurious effects to which they each can give rise ; Part III—standards of exposure ; Part IV—the manifold uses of ionizing radiations in medicine, agriculture and industry ; Part V—the general and special precautions appropriate for radiation workers in atomic energy plants, factories, hospitals and research laboratories ; Part VI—problems arising in uranium mining and processing ; Part VII—the packing, labelling and transport of radioactive materials. A number of appendices include the International Labour Office Model Radiation Code, a summary of the current I.C.R.P. recommendations on permissible doses and examples of suitable medical record forms for the clinical and haematological examination of radiation workers.

Copies of the report may be obtained from the International Labour Office in Geneva or from the United Kingdom Office at 38-39 Parliament Street, London, S.W.1, price 3s. 0d. (50 cents). It is also available in French and Spanish.

NATIONAL CERTIFICATES IN APPLIED PHYSICS 1955 EXAMINATIONS

The results of the 1955 examinations for Ordinary and Higher National Certificates in Applied Physics are given below :—

	Colleges	*Candidates*	*Certificates*	*Passes without Certificates*	*Fail*
England and Wales					
Ordinary ...	25	293	176	18	99
Higher ...	10	73	48	—	25
Scotland					
Ordinary ...	2	16	9	1	6
Higher ...	1	9	6	—	3

The candidates who passed the Examination but are not entitled to the award of certificates have completed only one year of the Ordinary course. Almost all of them hold General Certificates of Education with passes in mathematics and physics at the Advanced level and they take the final year of the Ordinary course in order to qualify for admission to the course for the Higher certificate.

In England and Wales distinctions are awarded only at the Higher certificate level and this year 17 distinctions were awarded (11 in mathematics, five in pure physics, one in applied physics). One candidate, G. C. Turner of Northampton Polytechnic, London, obtained 100% in the mathematics paper in the Higher certificate examination and three candidates (one from Northampton Polytechnic, London, and two from Birmingham College of Technology) obtained 99% in mathematics.

In Scotland there were no distinctions ("special mention" in Scotland) at the Higher level but five in the Ordinary examinations.

The Institute's assessors were Prof. J. D. Craggs (Physics), Dr. J. Topping (Mathematics), Mr. G. W. Warren (Applied Physics) in England and Wales. Dr. G. Morris was assessor for all three subjects in the Scottish examinations.

Comparative totals of candidates for the past four years are :—

	Higher	*Ordinary*
1952	33	137
1953	55	151
1954	75	206
1955	82	309

ADDITIONAL INSTITUTE MEETINGS

On Thursday, November 24, the Industrial Spectroscopy Group is holding a meeting at the Institute's House, beginning at 5.30 p.m. with tea served at 5.00 p.m. After the Group Annual General Meeting there will be a discussion on "Instrumental Requirements in Infra-Red and Ultra-violet Absorption Spectroscopy." This will be opened by Dr. A. C. Menzies who will speak on "Fundamental and Practical Design Considerations."

The Scottish Branch has arranged a course of five lectures to be given in the Department of Natural Philosophy of the University of Glasgow on Tuesday evenings, beginning on November 15 and weekly thereafter. The meetings begin at 7.15 p.m. The course is on "Computers and Computation." The first lecture on "Basic Principles and Simple Aids" is by Mr. T. H. O'Beirne. Full details have been circulated to Branch members.

PHYSICAL SOCIETY MEETINGS

Members of the Institute are invited to attend any of the following meetings of the Physical Society and its groups :—

Date	*Title*	*Lecturer*	*Place*
Nov. 11, 5.30 p.m. Acoustics Group	The acoustic interferometer	Dr. E. G. Richardson	London : Imperial College
Nov. 13 and 14	Autumn Meeting Applications of modern methods of computation in physics research		Cambridge : The University
Dec. 9, 5.30 p.m. Acoustics Group	Absorption of sound in humid air	Mr. E. J. Evans	London : Imperial College
Dec. 14, 3.30 p.m. Colour Group	The apparent brightness of coloured light sources	Mr. W. R. Stevens	London : Lighting Service Bureau

CORRESPONDENCE

In the *Bulletin* of September, 1955, it is stated that there are 170 vacant places per year in British Universities for entrance candidates wishing to study for an honours degree in Physics. One's first reaction on reading this is to ask where these vacancies are. I am informed that the information was obtained under conditions which are regarded by the Institute as confidential and that therefore no details can be divulged. Surely it is against the national interest if such information is not published openly.

It is when one deals with the conclusions drawn from a report like this that the actual details are so important. In interpreting data on this subject everything depends on what is meant by a "vacancy" for an honours student. That there are vacancies in some Universities is certainly true but I doubt very much whether there are in fact 170 vacancies for candidates who wish to begin their University career in October, 1955, with the intention of taking an honours degree in Physics. In any case it does not follow, as the article in the *Bulletin* implies, that because there are vacancies there are more vacancies than candidates. I think it is much more probable that most unsuccessful candidates do not know where the vacancies exist. Candidates are rejected at various dates up to late August and they will probably think that, at that date, it is not worth while applying anywhere else. In fact it is likely that if a candidate has been rejected by two or more Universities by March he would then give up. Since several Universities only accept approximately one fifth or less of the candidates who apply, this rejection is no reflection on a candidate's ability.

It seems to me regrettable that the Institute should issue a report on this subject without giving the detailed results obtained. I submit that, because the actual data are not given, the part of the report which deals with Universities is of little value and I think the comments on the report printed in the *Bulletin* might be very misleading. The conclusions drawn by Professors Mott and Thompson in their letter in the *Universities Quarterly* (1954 p. 380) are quoted in the *Bulletin* as "evidence." That these conclusions may not be justified is shown by R. R. Dale in a letter in a more recent issue of the same Journal (1955, p. 402).

JOHN IBALL.

Carnegie Laboratory of Physics,
Queen's College,
Dundee.

(*The following comment is made by the Deputy Secretary who conducted the enquiry :—*

In seeking data for the various surveys conducted by the Institute it has been assumed, and often explicitly stated, that no detailed information would be divulged without permission ; this is common courtesy and an essential requirement of confidence. Whether the publication of only summarized data renders the report of little value or, indeed, is " against the national interest " are, of course, matters of opinion.)

REVIEWS OF BOOKS

Physics (A Descriptive Interpretation). By CHARLES H. BACHMAN. (New York : John Wiley and Sons, Inc.) Pp. 497 + viii. Price 44s.

Professor Bachman, of Syracuse University, has based this lively and original book on his courses for students taking physics as part of a general curriculum. He does not oversimplify, and the book seems very suitable for people who have had no formal instruction in science, provided they are capable of intelligent analysis of a situation and are also prepared to do some really hard reading. He appeals to intuition and experience, and exploits freely the experience gained in everyday life in a world of applied science. For the more introspective, he appeals as skilfully as an advertiser to their interest in the workings of the human frame.

In the early sections of the book the author deals with measurement, variation, the conservation of energy, the electromagnetic spectrum, and fundamental particles of atomic physics. The rest is based deductively on these concepts, and the whole scheme is intellectually satisfying. It differs from the mathematical deduction expected of the embryo scientist, but should offer a stimulating challenge to the reader who has learned to exercise his mind actively in other disciplines.

G. R. NOAKES.

Basic Electrotechnics. By B. L. GOODLET. (London : Edward Arnold Limited.) Pp. 277 + viii. Price 24s.

This is the second edition of a book which first appeared in 1951, when it soon became recognized as an unusually good second year text book for university engineering students and not merely another elementary book on electricity and magnetism. It is written for engineers, with a maximum concentration of facts and figures per cubic metre, since we must use the appropriate units. Since the author stresses, in his preface, the need for conciseness, it is perhaps fair to

suggest that certain pages (68–76) on dielectric breakdown could be omitted, since the matter given is highly descriptive.

There are chapters on :—

(1) steady electric fields,
(2) electrostatic fields, condensers and dielectrics,
(3) electrodynamics,
(4) the calculation of magnetic fields,
(5) alternating currents,
(6) transient phenomena and
(7) Maxwell's equations and electromagnetic waves.

Chapter (6) was written for the second edition which also includes new material on three phase systems.

The whole book is clearly the work of an experienced teacher who was not content with anything less than the maximum possible amount of originality in his lectures. Even so, it is difficult for anyone, however distinguished and resourceful, to be very original in the elementary aspects of a subject, and indeed the author might even be considered to fall from grace with the expression (p. 51) " a closed surface is a surface having no edge, like that of an egg." I am reminded of Saki's story of the man who attempted to breed hens that would lay eggs with flat sides, for more efficient packing.

Reviewer's flippancies aside, however, the book may certainly be recommended without reservation for the first stages of a university course in engineering. The exercises are well considered and most valuable for elementary problem classes. The book is well produced and reasonable in price.

J. D. CRAGGS.

Fundamental Formulas of Physics. Editor DONALD H. MENZEL. (New York : Prentice-Hall, Inc. Distributors : Bailey Bros and Swinfen Ltd., London.) Price 108s. Pages 765 + xxxv.

In his preface the editor states that the intended primary function of this volume is one of reference and guide for research. This intention has been amply fulfilled, if the book is treated as a compilation of formulae, not always derived or explained, rather than a textbook. Its main use will be to the research physicist, to the teacher of advanced physics whose work may lead him to unfamiliar paths, and to the near-physicist whose main interests lie elsewhere. The mathematician, chemist, metallurgist or even biologist will find this book useful.

Notable omissions from such a large collection of data are sections on X-ray optics and crystallography, but it is refreshing to find included chapters on topics other than those usually associated with books on physics, e.g. meteorology, biophysics and physical chemistry.

In a volume such as this, in which there are many contributors with different lines of approach working independently, it is unfair to pick out the more striking chapters, but one must say that the opening chapter on basic mathematical formulae is an excellent reference in itself for any serious physicist. A glance through the names of the contributors is an assurance that each chapter is authoritative.

N. THORLEY.

Elements of Atomic Physics. By D. C. PEASLEE and H. MUELLER. (New York : Prentice-Hall.) Pp. 394 + ix. Price 80s.

An Outline of Atomic Physics. By O. H. BLACKWOOD, T. H. OSGOOD and A. E. RUARK. (New York : John Wiley and Sons, Inc.) 3rd Edition 1955. Pp. 501 + x. Price 60s.

These two books may conveniently be reviewed together, although there are greater differences in their scope than the mere titles would suggest.

The work by Peaslee and Mueller is a fairly normal general honours students' book on atomic physics. There are at least two British, and cheaper, alternatives so that a large sale amongst undergraduates here cannot be expected. Comparisons, it is said, are invidious and this rather meaningless dictum will gladly be taken as an excuse for evading them. In the present work there are, in numerical order, chapters on particle beams in fields, magnetic, optical and electrical properties of atoms, X-rays, optical spectra, special theory of relativity, wave mechanics, electron spin and multiplet spectra, modern developments (a rather curious title which apparently means nuclear spins, molecular beam studies, nuclear shell models, the Lamb shift and so forth) and quantum mechanics. The material is carefully chosen, the treatment is excellent and skilful, as we have the right to expect from distinguished authors, but the sequential arrangement of the chapters seems unsatisfactory. It is surely important that students should be taught to appreciate the orderly (not necessarily historical) development of a subject and certain of the older books on this subject are perhaps better in this respect, even if they fail elsewhere. The authors, it must be said, despite the above comment, make it clear that they have worked to a system. The groups of problems constitute an excellent feature of the book, and they should certainly be tackled in reasonable numbers by all really interested degree students.

An Outline of Atomic Physics is an unusual and interesting book, with a striking green cover depicting two earnest and highly technical people inserting a rod (apparently against strong friction) in a pile.

There are fifteen chapters on practically all the sub-topics of atomic and nuclear physics, for example on kinetic theory, the electronic

charge, the nature of radiant energy, the Bohr atom, X-rays, wave mechanics, atomic spectra, molecular structure, radioactivity, nuclear reactions and cosmic rays. The most interesting feature is the standard of the book, which (the authors state) is intended mainly for students other than those specializing in physics, and which is perhaps just a little beyond the members of an advanced 6th Form in a science-conscious school. Thus, it would be stimulating reading for a first year University student of chemistry or engineering, although it would be interesting to know how many such students, in America or Britain, have read through this or any similar book (now in its 3rd Edition, a clear indication of its success). It may be that books of this kind will become more and more important as technocracy tightens its grip and sandwich courses and the like become commoner.

The figures are unusually good and the general production of the book is excellent. Again, the provision of many problems, numerical and otherwise, is a good feature and here is an example : " Let a fast primary proton fall on a resting proton near the top of the atmosphere. Draw a labeled (*sic*) chart showing, for a chosen sequence of events, the nature and fate of all the progeny." The ominous nature of the last sentence seems also almost prophetic, taken out of its context.

J. D. CRAGGS.

Optics and Sound. By C. A. PADGHAM. (London : Sir Isaac Pitman & Sons, Ltd.) Pp. 434 + vii. Price 16s.

The Optics and Sound syllabi of the Intermediate B.Sc. course, the Advanced level of the General Certificate of Education and the final year of an Ordinary National Certificate course are adequately covered in this book. Some supplementation, especially in physical optics would be required by scholarship candidates.

The book is characterized by the number and excellence of its diagrams, the eye being included whenever virtual images are being considered. The style is clear and concise, and, in geometrical optics especially, many examples are worked in the text. A representative selection of questions from Intermediate B.Sc. and Advanced level papers occur at the end of each chapter.

In the Optics section the cartesian sign convention is used in accordance with the recommendations made in the Teaching of Geometrical Optics (1934) by the Committee of the Physical Society. This convention offers important advantages at all levels above Ordinary of the General Certificate of Education and links readily with more advanced work and technical optics. Use of the symbols l, l' for object and image distances leads to more symmetrical equations which are more easily memorized.

Frequent references to the wider aspects of the subjects are made. It is particularly pleasing to see an account of the basic principles of the production of optical surfaces and a chapter on photometry which includes some of the more recent developments. The Sound section includes an important chapter on wave motion leading to stationary waves, beats and the addition of simple harmonic motions. It is a little surprising however to find that a proof of the velocity of sound in a gas is not given, as this is required by some examining bodies.

This book should prove most stimulating and helpful to all students studying at this level and should provide an excellent background for further study.

T. A. LITTLEFIELD.

NEWS OF MEMBERS

Fellows

F. P. BOWDEN has been awarded the Franklin Institute's Elliott Cresson Medal.

J. N. CARRUTHERS has been awarded the Commemorative Medal of Prince Albert 1st (Prix Manley-Bendall) by the Institut Oceanographique of Monaco and Paris.

J. D. CRAGGS has been appointed Professor of Electronic Engineering in the University of Liverpool.

PROF. W. E. CURTIS has retired from the Chair of Physics in the University of Durham (Newcastle Division).

M. R. GAVIN has been appointed Professor of Applied Electricity in the University College of North Wales, Bangor, and will take up the post at the end of the year.

E. GRIFFITHS has been re-elected President of the Congress of Refrigeration.

J. D. HOLMES is now Technical Director of Holophane Limited, London.

A. A. HIRST has been appointed Deputy Director of the Central Engineering Establishment, National Coal Board, Burton-on-Trent.

W. A. JENNINGS has been appointed Clinical Physicist to the Argonne Cancer Research Hospital, University of Chicago, Illinois, for a period of one year.

SWAMI JNANANANDA has been appointed Goutami Professor of Physics at the Andhra University, India.

N. LEVIN is now Chief of Research Laboratories, British Optical and Precision Engineering Ltd., London.

SIR THOMAS MERTON has received the honorary degree of Doctor of Laws of the University of Aberdeen.

G. D. MORGAN has now joined the staff of the Director of Scientific Control at the Headquarters of the National Coal Board.

PROF. N. F. MOTT has been awarded the honorary degree of Doctor of Science of the University of Bristol.

S. R. RAO has been appointed Professor of Physics in the Sri Venkareswara College, Tirupati.

G. D. ROCHESTER has been appointed Professor of Physics in the University of Durham (Durham division).

E. L. YATES has been appointed Professor of Physics in the University College of Rhodesia and Nyasaland.

Associates

F. H. BAYLEY has joined the Research Department of Export Packing Service, Sittingbourne.

E. J. BURTON is now a Senior Scientific Officer of the Industrial Group of the United Kingdom Atomic Energy Authority, Capenhurst.

P. DAVIS has been appointed Senior Lecturer in Physics at the Kumasi College of Technology, Gold Coast.

H. HUXLEY has been appointed Head of the Department of Physics and Mathematics in the Plymouth and Devonport Technical College.

P. L. KIRBY is Senior Physicist in the new Research Unit of Rowntree and Company Ltd., York.

J. A. JENKINS is employed as a physicist at the Research Centre of the Dunlop Rubber Company Ltd., Birmingham.

K. N. MIDDLETON is now Supervising Engineer (Television) with the Australian Broadcasting Commission, Sydney.

G. F. MORTON has been appointed Research Manager of Dunlop Cotton Mills Ltd., Rochdale.

N. B. RAJCHENBAUM has taken up an appointment with William Tatton and Company Ltd., Leek.

E. F. SAWYER has been appointed Headmaster of Bilston Grammar School.

H. W. SEXTON has been promoted to Senior Experimental Officer, Atomic Research and Development Establishment, Ministry of Supply.

G. H. TATTERSALL has taken up an appointment as a Research Physicist on the staff of the British Rayon Research Association, Manchester.

T. WAINWRIGHT is now Senior Scientific Officer at the Research Council of the British Whiting Federation, Welwyn.

J. WALTERS has taken up an appointment as Lecturer in Physics at the Wigan and District Mining and Technical College.

Graduates

K. H. J. ADAMS is now employed as a Senior Engineer by Mullard Radio Valve Company Ltd.

P. F. BURDEN is a Development Engineer at Short Bros. and Harland Ltd., Belfast.

E. W. CARPENTER has taken up an appointment as a Scientific Officer at the Atomic Weapons Research Establishment, Foulness.

D. C. E. HANNEY is employed by the Electric and Musical Industries Engineering Development Ltd., Somerset.

W. J. GUNNING has been appointed an Assistant Engineer with Standard Telephones and Cables Ltd., Ilminster.

D. P. MAC CARVILL is now employed by the Institute of Industrial Research and Standards, Dublin.

R. J. POOLE has been transferred from the Shell Company of Singapore Ltd., to the Shell Company of Australia Ltd., Melbourne.

A. M. SHORT has joined the staff of Brighton Technical College.

THE REGISTER

ELECTIONS TO MEMBERSHIP

An asterisk (*) indicates transfer from another grade

Fellows

*Aldrich-Smith, Ronald N., M.Sc., Head Instrument Engineer, British Nylon Spinners, Ltd., Pontypool.

*Edwards, Alun, B.Sc., Ph.D., Technical Manager, James Neill & Company (Sheffield) Ltd.

*Fletcher, Wilfred P., B.Sc., Superintendent of Technical Research, British Rubber Producers' Research Association, Welwyn Garden City.

*Howarth, John L., M.A., B.Sc., M.Sc., Head of Radiation Physics Dept., Lovelace Foundation for Medical Education and Research, New Mexico, U.S.A.

Lucas, Lloyd N. D., M.Sc., Ph.D., Lecturer in Physics, University of Western Australia.

Meltzer, Bernard, B.Sc., Ph.D., Research Engineer, Electric and Musical Industries Research Laboratories Ltd., Middlesex.

Muller, Walter M. M., D.Phil., Physicist, Telecommunication Company, Australia.

Nelson, James B., Ph.D., Head of the Mineralogy Section, British Coal Utilization Research Association.

*Taylor, Victor H., B.Sc., Principal Scientific Officer, Admiralty Research Laboratory, Teddington.

Whitfield, George A., B.Sc., Professor and Head of the Department of Aircraft Electrical Engineering, College of Aeronautics, Cranfield.

Associates

*Aldous, Graham A., M.Sc., Research Worker, British Scientific Instrument Research Association, Chislehurst.

Ashworth, Derek R., M.Sc., Scientific Officer, Tube Investments Research Laboratories, Hinxton Hall, Saffron Walden.

Beattie, John R., B.Sc., Physicist, Pilkington Brothers Ltd., Lancashire.

*Billington, Ernest W., B.Sc., Scientific Officer, Royal Naval Scientific Service.

*Beck, Alan E., B.Sc., Research Student, Department of Geophysics, Australian National University.

Brown, Brian J., B.Sc., Engineer, British Telecommunications Research Ltd., Taplow.

*Buchanan, John S., B.Sc., Ph.D., Scientific Officer, Armament Research and Development Establishment, Ministry of Supply.

*Carmen, Eric H., M.Sc., Ph.D., Principal Research Physicist, B.S.A. Group Research Centre, Sheffield.

Cook, Albert, B.Sc., Manager, Health Physics and Safety Group, United Kingdom Atomic Energy Authority, Springfield Works, Lancashire.

*Cowell, Norman D., B.Sc., Research Physicist, W. Edwards & Company (London) Ltd., Crawley.

Dennis, Thomas H., B.Sc., Senior Physics Master, Quarry Bank High School for Boys, Liverpool.

*Fortune, Ronald D., B.Sc., Scientific Officer, Admiralty Research Laboratory, Teddington.

*Grimsdell, John L., M.A., Assistant Examiner, Physics General Certificate of Education, University of London.

*Hickson, Kenneth, B.Sc., Lecturer in Physics, Wigan and District Mining and Technical College.

*Hill, Dennis W., M.Sc., Physicist, Hivac Ltd., Harrow.

*Holmes, John W., B.Sc., Research Officer, C.S.I.R.O., Adelaide.

*Hotston, Eric S., B.Sc., Research Assistant, College of Technology, Birmingham.

James, Brian D., B.Sc., Ph.D., Scientific Officer, Royal Naval Scientific Service, H.M. Underwater Detection Establishment, Portland.

*Jiggins, Alan H., B.Sc., Research Worker, British Scientific Instrument Research Association, Chislehurst.

Kennell, Charles G., B.Sc., Lecturer in Physics, Croydon Polytechnic.

Lampard, Douglas G., M.Sc., Ph.D., Visiting Lecturer, Department of Electrical Engineering, University of Columbia, New York, U.S.A.

Leach, James S. L., B.Sc., Ph.D., Research Staff, Murex Welding Processes, Waltham Cross, Hertfordshire.

*Lucken, Jack A., M.Sc., Research Physicist, Electric and Musical Industries Research Laboratories Ltd, Middlesex.

*Malkin, Frank, B.Sc., Scientific Officer, British Ceramic Research Association, Stoke-on-Trent.

*Marshall, Neil, M.A., Scientist, Grade IV, British Coal Utilization Research Association, Leatherhead.

O'Brien, Patrick A., M.Sc., Ph.D., Lecturer in Physics, University of Natal, Durban, South Africa.

*Parker, Norman S., B.Sc., Ph.D., Scientific Officer, U.K. Atomic Energy Authority.

Pepper, Richard B., B.Sc., Divisional Physicist, National Coal Board, Arnold, Nottingham.

Pickup, Bryan, M.A., B.Sc., Research Physicist (Group Leader), Dunlop Rubber Company Ltd., Birmingham.

*Prentice, Thomas R., B.Sc., Technical Officer, Imperial Chemical Industries Ltd., Stevenston.

*Price, Ronald E., M.Sc., Physicist, Australian Research Laboratories.

*Purslow, Brian W., B.Sc., Ph.D., Lecturer in Physics, University of Malaya.

*Richards, Conway B., B.Sc., Research Physicist, Electric Cables Ltd., High Wycombe.

*Scregg, Sidney, M.A., Experimental Officer, Tropical Testing Establishment, Ministry of Supply.

Sinha, Dwinjendra B., M.Sc., Ph.D., Lecturer, Department of Applied Physics, University of Calcutta.

Smith, Dorothy J., B.A., Lecturer in Physics, University of Malaya.

Steadman, Ralph, B.Sc., Assistant Lecturer in Physics, Huddersfield Technical College.

*Studley, Thomas, B.Sc., Research Physicist/Metallurgist, Steel Company of Wales, Newport.

Thomas, Alan G., M.A., Physicist, British Rubber Producers' Research Association, Welwyn Garden City.

Thorton, Barry S., B.Sc., M.Sc., Research Officer, C.S.I.R.O., Australia.

*Wallis, Patrick B., B.Sc., Senior Research Engineer, English Electric Company Ltd., Luton.

*Woffinden, Geoffrey B., B.Sc., Shop Manager, United Kingdom Atomic Energy Authority, Windscale Works.

Wyard, Sidney J. B. A., Ph.D., Lecturer in Physics, Guy's Hospital Medical School, London.

Graduates

*Balkey, Peter R., B.Sc., Research Student, Textile Department, The Technical College, Bradford.

Barr, Peter, B.Sc., Experimental Officer, United Kingdom Atomic Energy Authority.

Budworth, David W., B.Sc., Research Student, University of Leeds.

Bull, Harold T., B.Sc., Junior Engineer, Guided Weapons Division, Electric and Musical Industries Engineering Development Ltd.

Bushill, Geoffrey C., B.Sc., Graduate Apprentice, The Edison Swan Electric Co. Ltd.

Clark, Robert B., B.Sc., Assistant Experimental Officer, Atomic Weapons Research Establishment, Aldermaston.

Clemson, Colin S., B.Sc., Technical Officer, The British Cotton Industry Research Association, Manchester.

*Cooke, Ian, B.Sc., Research Student, Department of Electron Physics, University of Birmingham.

Crosby, Robert G., B.Sc., Lecturer, Marconi's Wireless Telegraph Co. Ltd., Chelmsford.

Darling, John R., Physics Master, The College, Winchester.

Dawson, Thomas W. G., B.A., Scientific Officer, Royal Aircraft Establishment, Farnborough.

*Devall, John W., B.Sc., Royal Electrical and Mechanical Engineers.

*Ford, Derek R. G., Assistant Experimental Officer, Admiralty Research Laboratory, Teddington.

Forsyth, John B., B.A., Research Student, Cavendish Laboratory, Cambridge.

Gourley, Arthur C., B.Sc.

Gouw, Engeline E. N., B.Sc., M.Sc., Hospital Physicist, General Hospital, Singapore.

Hazra, Gurudas, B.Sc., M.Sc., Trainee, Cambridge Instrument Company Ltd., Cambridge.

Hawkins, Alfred G., B.Sc., Physicist, British Insulated Callenders Cables Ltd.

Holister, Geoffrey S., B.Sc., Research Student, Department of Civil Engineering, University College, London.

Hopkins, Horace L., B.Sc., Senior Assistant Technical Officer, Imperial Chemical Industries Ltd., Witton.

Hudd, Roger C., B.A., Research Student, Crystallographic Laboratory, Cavendish Laboratory, Cambridge.

*Johnston, John McK., Chief Spectrographer, Babcock & Wilcox Ltd., Renfrew.

*Jones, John C., B.Sc., Physics Master, Colfe's Grammar School, London.

Jowitt, Donald, Assistant Experimental Officer, United Kingdom Atomic Energy Authority, Harwell.

*Joy, Alan R., Radioactive Isotope Technician, Physics Department, London Hospital.

Kelly, Brian T., B.Sc., Scientific Officer, United Kingdom Atomic Energy Authority.

Lloyd, Christopher J., B.Sc., Laboratory Assistant, Parkinson Stone Company, Birmingham.

Main, Iain G., B.Sc., Shell Oil Fellow, Department of Physics, Queen's University, Kingston, Ontario.

Marshall, Amy M., M.Sc., Experimental Officer, Aeronautical Research Laboratories.

Metcalfe, Charles S., B.Sc., Radio Valve Development Engineer, Mullard Radio Valve Company Ltd.

Mott, Gerald, B.Sc., Research Physicist, Mullard Research Laboratory, Salfords.

Muir, Norman, B.Sc., Technical Assistant, Guided Weapons Controls Laboratory, Bristol Aeroplane Company Ltd.

*Murrell, Stanley A. F., B.A., Development Engineer, Standard Telephones and Cables Ltd., London.

Parker, John J., B.Sc., Research Physicist, Dunlop Rubber Company.

Parker, Kenneth R., B.Sc., Assistant Technical Officer, Imperial Chemical Industries Ltd., Witton.

*Read, William E., B.Sc., Physicist, Research Laboratories, The General Electric Company, Wembley.

Rowan, David, Technician, Physics Laboratory, Weston Regional Hospital Board, Glasgow.

Sammons, William A., B.Sc., Scientist, National Coal Board.

Scott, Kenneth, B.Sc., Senior Assistant, Siemens Electric Lamps and Supplies Limited, Preston.

*Sekyim-Kwandoh, Assua K., B.Sc., Graduate Apprentice, Electrical Research Association, Perivale.

Shepherd, Joseph, B.Sc., Research Student, University of Manchester.

Slater, Philip N., B.Sc., Research Student, Imperial College, London.

Smith, Cyril W., B.Sc., Assistant Experimental Officer, Radar Research Establishment, Ministry of Supply, Gt. Malvern.

Stirling, Alan W., B.Sc., Laboratory Engineer, Standard Telephones and Cables Ltd.

Stuttard, Bernard, B.Sc., Meter Development Engineer, Ferranti Limited, Hollinwood.

Swingler, Donald L., B.Sc., Technical Officer, C.S.I.R.O., Australia.

Tillen, Ronald J., Scientific Assistant, Associated Electrical Industries Limited, Aldermaston.

Tipping, Frederick R., Development Engineer, Mullard Blackburn Works.

Tyler, Peter M., B.Sc., Assistant Engineer, English Electric Valve Company Limited, Chelmsford.

*Watts, James, Electron Microscopist, British Paper and Board Industry Research Association, Kenley.

Wraight, Henry G. H., B.Sc., Assistant Experimental Officer, Department of Scientific and Industrial Research, Joint Fire Research Organization, Boreham Wood.

Ziman, Geoffrey C., B.A., Graduate Apprentice, Marconi Instruments Ltd., St. Albans.

Imperial Chemical Industries Limited requires **Instrument Managers** to combine with engineering organizations in the development of new projects in the field of organic chemicals, including synthetic fibres. There are opportunities for candidates to obtain senior managerial positions in the instrument sphere and in addition to extend into the general engineering organization. Candidates must be of good degree standard and preferably not older than 30. Previous industrial experience an advantage but systematic training will be given to promising candidates without industrial service. Service in the Armed Forces, particularly as officers in a technical branch, will be taken into consideration. After joining the staff married men will receive a reasonable refund of removal (including travel) expenses and to assist them in house purchase, facilities are available in approved cases for substantial loans ; in addition legal charges will be advanced. Applications in writing to Staff Department, Hexagon House, Blackley, Manchester, 9.

The Water Research Association, recently constituted by the water supply undertakings of Great Britain, invite application for the post of :

Physicist experienced in electronics and with an interest in acoustics, to work on problems connected with underground leakage detection by electro-acoustic methods. Candidates should have two or three years postgraduate experience, but an exception will be made if they show a keen interest in this work. No previous experience of water supply is necessary. This project is of great importance to the industry, and this will be reflected in its priority in the Association's programme. The Laboratories are located in ideal surroundings and prospects of promotion within this newly formed organization are obviously high. Starting salary £650–£850.

Applications should be forwarded immediately to the Director, at The Laboratories, 18 Linkfield Lane, Redhill, Surrey.

Physicist required to lead team in physics section of a metallurgical research laboratory. Applicants must be knowledgeable in the application of physical techniques to metallurgical materials and processes. Age 30-35. Initial salary £1,100 upwards depending on qualifications and experience. Apply : Research Manager, **British Non-Ferrous Metals Research Association,** 81-91 Euston Street, London, N.W.1.

College of Technology, Birmingham
Department of Physics and Mathematics

There is a vacancy for a **Research Assistant** in electronics. Candidates must have a good honours degree in physics, preferably from a University which awards higher degrees externally. The appointment involves a small amount of teaching.

The salary is in accordance with the Burnham (Further Education) Scale for Grade "A" Assistants. Basic salary (Men) £510 (Women) £453 (Plus equal pay increment) with increments for approved training and industrial or teaching experience.

Further particulars and form of application may be obtained from the Registrar, College of Technology, Suffolk Street, Birmingham, 1, on receipt of stamped addressed foolscap envelope. Completed forms should be returned to him not later than November 24, 1955.

K. R. Pilling,
Clerk to the Governing Body

Associated Electrical Industries Limited, Research Laboratory,
Aldermaston.

Vacancies exist for graduates **Scientists** and for **Assistants** to undertake long-term research in problems of Physical Metallurgy associated with Nuclear Energy. Scientists should have honours degrees in physics, metallurgy or chemistry with some experience of research. Assistants should have a Higher National Certificate or equivalent qualifications.

The laboratory serves a large group of Companies. It is situated in pleasant rural surroundings near Reading, with a train service to London (one hour).

Please write, giving full details of qualifications and experience, and quoting reference No. M/R/GA/1, to Personnel Officer, Research Laboratory, Associated Electrical Industries Limited, Aldermaston Court, Aldermaston, Berkshire.

National Coal Board
Durham Division

Applications are invited for a **Physicist** at the Durham Dvisional Scientific Headquarters, Newcastle upon Tyne, to carry out fundamental and applied research into physical problems of the Mining Industry. In the first instance, these will be concerned with the physical properties of fine particles and dust suppression.

Applicants should possess a good Honours Degree in Physics and should have had experience of research work. Starting salary according to qualifications and experience within the scale £925 x 35-£1,300. Applications with full details, within 10 days, to :—Assistant Secretary (E), National Coal Board, Durham Division, "D" Floor, Milburn House, Newcastle upon Tyne, 1.

British Steel Castings Research Association. Physicist required for research related to steel foundry practice. New research station being built. Good opportunity for the right man. Salary according to qualifications and experience.

Canterbury University College
Christchurch, New Zealand

Applications are invited for the position of **Lecturer in Physics.** Applicants should have an honours degree and experience in research.

The salary attached to the position will be at the rate of £911 7s. 0d. per annum rising by annual increments of £50 to £1,061 7s. 0d. per annum.

An allowance is made towards travelling expenses ; duties to be assumed on 1st February, 1956, or as soon thereafter as can conveniently be arranged.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1.

The closing date for the receipt of applications, in New Zealand and London, is November 28, 1955.

Mass Spectrometry. There is a vacancy for a physicist or physical chemist with some experience in this field to initiate a programme on the study of impurities in semiconductors and the application of mass spectrometry to the study of solid surfaces. Box No. 88, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

South Manchester H.M.C. Christie Hospital and Holt Radium Institute,
Manchester 20.

Applications are invited for the position of **Physicist** (basic grade) in the Clinical Physics Department of the above Hospital. Applicants should hold an Honours degree in physics, previous experience of Medical Physics is not essential. The salary will be in the range £525 to £845 according to qualifications and experience. Applications with names of two referees, should be sent to the Administrative Officer as soon as possible.

British Petroleum Company Limited requires a qualified **Mechanical Engineer** for research into the design and production of new instruments for geophysical exploration, and also to take charge of the general workshops and small drawing office. Applicants should have, in addition to sound background of the fundamentals of their subjects, practical knowledge of the uses and limitations of engineering materials and methods as applied to the design of precision instruments, an understanding of the principles of kinematic design and some experience in research. A first-class man is required for this interesting project and an appropriate salary will be paid. The vacancy is in the Company's Research Station, which, for the time being, is situated in Nottinghamshire. Good Pension Scheme. Write, stating age and giving full details, quoting H.3330A, to Box 8226 c/o 191 Gresham House, E.C.2.

Associated Electrical Industries Limited,
Research Laboratory,
Aldermaston

Expanding group engaged in the study of Fundamental Nuclear Physics requires **Research Physicists, Research Assistants** and **Laboratory Assistants.**

Unique opportunities exist for joining or leading teams engaged in a variety of experiments using ion beams from two van de Graaff accelerators and the most recently developed ancillary equipment.

The minimum qualification for the posts of Research Physicist is a first or good second class honours degree. The salary offered will be in the range £550 to £1,300 depending on age, qualifications and experience.

Applicants for the Assistant posts should have H.N.C. or O.N.C. or equivalent qualifications. The salary range will be in the range £400 to £1,050.

The Laboratory serves a large group of Companies. It is situated in pleasant rural surroundings near Reading.

Please write, giving full details of qualifications and experience, and quoting reference No. N/G/A/1, to Personnel Officer, Research Laboratory, Associated Electrical Industries Limited, Aldermaston Court, Aldermaston, Berkshire.

Albright and Wilson Ltd., require a science graduate of Ph.D. standing or equivalent, for the Chemical Physics Section of their Research Department at Oldbury, to develop X-ray and spectrographic techniques as applied to chemical problems. The post should appeal to a physicist, but a chemist with an interest in, and experience of these methods might be suitable. The appointment carries a good commencing salary and is permanent and pensionable. Those interested are invited to write to the Staff Officer, Albright and Wilson Ltd., Oldbury, Birmingham. Reference 259.

Woolwich Polytechnic, London, S.E.18
Principal :—J. S. Tait, Ph.D., B.Sc., A.R.T.C., M.I.E.E., A.M.I.Mech.E.

Applications invited from graduates for an **Assistant Grade A** to teach elementary Physics to technological and other students up to the G.C.E. (Advanced Level).

The Physics Department is large with a wide variety of work, and opportunities for a suitably qualified candidate to do more advanced teaching may arise later. Industrial experience would be an advantage.

Burnham Further Education salary scale. Particulars and application form from Clerk to Governors, to be returned by November 22, 1955.

Victoria University College Wellington, New Zealand

Applications are invited for a **Senior Lectureship in Physics.**

The salary will be £1,111 7s. 0d. per annum, rising by annual increments of £50 to £1,311 7s. 0d. The initial salary will be determined according to the qualifications and experience of the appointee. (University salaries are at the present moment the subject of discussion between the University Grants Committee and the Government.)

An allowance is made towards travelling expenses. Duties to be assumed on March 1, 1956, or at such other date as may be agreed on by the College Council.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1.

The closing date for the receipt of applications, in New Zealand and London, is November 21, 1955.

The University of Sheffield

Applications are invited for **Research Fellowships** tenable in the Department of Glass Technology. A Junior and a Senior Fellowship are available, the stipends ranging from £400 to £1,000 per annum, together with superannuation provision under the F.S.S.U. The normal tenure of the Junior Fellowship would be three years and of the Senior Fellowship five years, but both appointments will be for two years in the first instance. The object of the Fellowships is to advance knowledge in the field of glasses, and applicants should be physicists or physical chemists. For the Senior Fellowship some research experience would be expected. Applications (three copies), including the names and addresses of referees and, if desired, copies of testimonials, should reach the Registrar, from whom further particulars may be obtained, not later than December 15, 1955.

Development Engineers and Physicists

Applications are invited from Development Engineers and Physicists to fill a vacancy in the laboratories of **Louis Newmark Ltd.,** for work on the development of electromagnetic devices principally for incorporation in aircraft instruments and equipment. A degree or similar qualification is considered essential, and some previous laboratory or engineering industrial experience in any field desirable. The position carries considerable responsibility and offers plenty of opportunity for advancement. Applicants should be of British nationality. Pension Scheme. Please apply in writing giving full particulars to : Personnel Officer, Louis Newmark Ltd., Prefect Works, Purley Way, Croydon.

University of Oxford
A.E.I. Fellowship

Applications are invited for a Research Fellowship tenable in the Engineering Laboratory, Oxford University. The Fellow will be required to work under the direction of the Donald Pollock Reader, Dr. H. Motz, on problems of Millimeter Wave Generation. Some of the work will be carried out at Aldermaston, Berkshire, in the Laboratories of the Associated Electrical Industries. The Fellowship is tenable for three years in the first instance and the initial stipend will be in the range of £650 to £850, depending on qualifications. Candidates should have a degree in Electrical Engineering or in Physics ; experience in microwave research would be a great advantage. Applications should be sent to Professor A. Thom, Engineering Laboratory, 19 Parks Road, Oxford.

Radiological Protection Service (Ministry of Health and Medical Research Council), Downs Hospital, Cotswold Road, Sutton, Surrey, requires the following scientific staff :—

(1) **Radiochemist** for development of techniques to determine radioisotopes in liquid, solid and gaseous media, e.g., excreta, dust samples from atmosphere, medicaments.

(2) **Physicist,** initially for duties involving collection and collation of research information to permit the assessment of permissible levels of ionizing radiation for human beings and of protective procedures against high-energy X-rays and heavy particles. Opportunity for experimental research later.

(3) **Physicist,** for development of techniques for measuring ionizing radiations and radioisotopes.

Applicants for post (1) should have an honours degree in Chemistry or its equivalent, and preferably some experience in radiochemistry, for (2) an honours degree in Physics, or its equivalent, and preferably with training and interests in mathematical physics, and for (3) an honours degree in Physics, or its equivalent, with training in electronics.

Salary (according to age and experience) at point in scales :—£500 × 35 – 535 × 30 – 565 × 25 – 690 ; £715 × 35 – 750 × 50 – 900.

Child allowances (£50 per dependent child) payable in addition. Superannuation provision.

Candidates should write to Mr. W. Binks, Director of the Service, giving full details of academic and subsequent careers and names of two professional referees.

South-East Essex Technical College and School of Art
Longbridge Road, Dagenham

Applications invited for appointment as **Research Assistants** to carry out fundamental research in the field of X-ray production (1 post) or Organic Chemistry (2 posts). Candidates should hold a good honours degree. Salary £350 per annum.

Details from Clerk to the Governors at the College.

British Rayon Research Association

Physicists required for fundamental research into (a) mechanical properties and (b) optical properties of high polymers in relation to their chemical and physical structures. Applicants should have good Physics degree, preferably with some research experience. Superannuation under F.S.S.U. Applications, specifying vacancy, to the Appointments Officer, Heald Green Laboratories, Wythenshawe, Manchester, 22.

Scientists and Engineers required by **National Coal Board** Research Establishment (London Area) for important research on mining problems, including fundamentals of methods of extracting coal from seams, strata support, conveying coal to the pit bottom and environmental conditions. Basic research and instrumentation are involved and much of the work is carried out initially in the laboratory and later underground.

Appointments (superannuable) will be in the following grades, at salaries dependent on qualifications and experience :

Scientists in three grades, with inclusive London scales of £1,365 – £1,750, £991 – £1,390, and £617 – £1,124 male *or* **Scientific Technical Officers** also in three grades, with inclusive London scales of £893 – £1,055, £603 – £839, and £472 10s. 0d. – £642 male.

For Scientists grades, good honours degrees in physics or mechanical engineering or equivalent professional qualifications are required. Vacancies in the Scientific Technical Officer grades are for physicists, engineers or metallurgists with O.N.C., H.N.C., or equivalent. Junior grades are encouraged in further education. Excellent career-prospects.

Write, giving full particulars of age, education, qualifications and experience to National Coal Board, Central Research Establishment II, Worton Hall, Isleworth, Middlesex, marking envelope SS/102. For suitable candidates, informal interviews can be arranged by appointment to discuss the work with senior members of the staff on Saturday mornings at Hobart House, London, S.W.1.

University of Birmingham
Department of Industrial Metallurgy

Two vacancies exist in research teams concerned with the joining of metals and with the fatigue of light alloys. The successful applicant will be encouraged to submit work for higher degrees and allowances additional to salary will be made to cover all University fees. Applications are invited from suitably qualified metallurgists, physicists and chemists. Initial salaries are in the range of £400–£500, depending on age and experience. Applications in writing to the Department of Industrial Metallurgy, University, Birmingham 15.

Monmouthshire Education Committee
The Technical College of Monmouthshire, Crumlin

Principal : Dr. T. V. Starkey, F.Inst.P.

An Assistant Lecturer in Chemistry is required on the 1st of January, 1956, or as soon as possible thereafter.

Candidates must possess a good Honours Degree or Associateship of the Royal Institute of Chemistry and should have had research and/or industrial experience. Teaching experience would be regarded as an added qualification. The post involves the teaching of chemistry and particularly of physical chemistry to graduate level. Encouragement is given to research.

The salary is in accordance with the scale for Assistant Lecturers Grade B.

Further particulars and forms of application obtainable from the undersigned must be returned not later than November 30, 1955. C. E. Gittens, Director of Education, County Hall, Newport, Mon.

MEMBER'S ADVERTISEMENT

Chartered Patent Agent (B.Sc., A.Inst.P.) : professional services available. Box No. 80, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

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